RDF Equipment and Accessories Catalog

A Specialty Gases and Equipment Supplement

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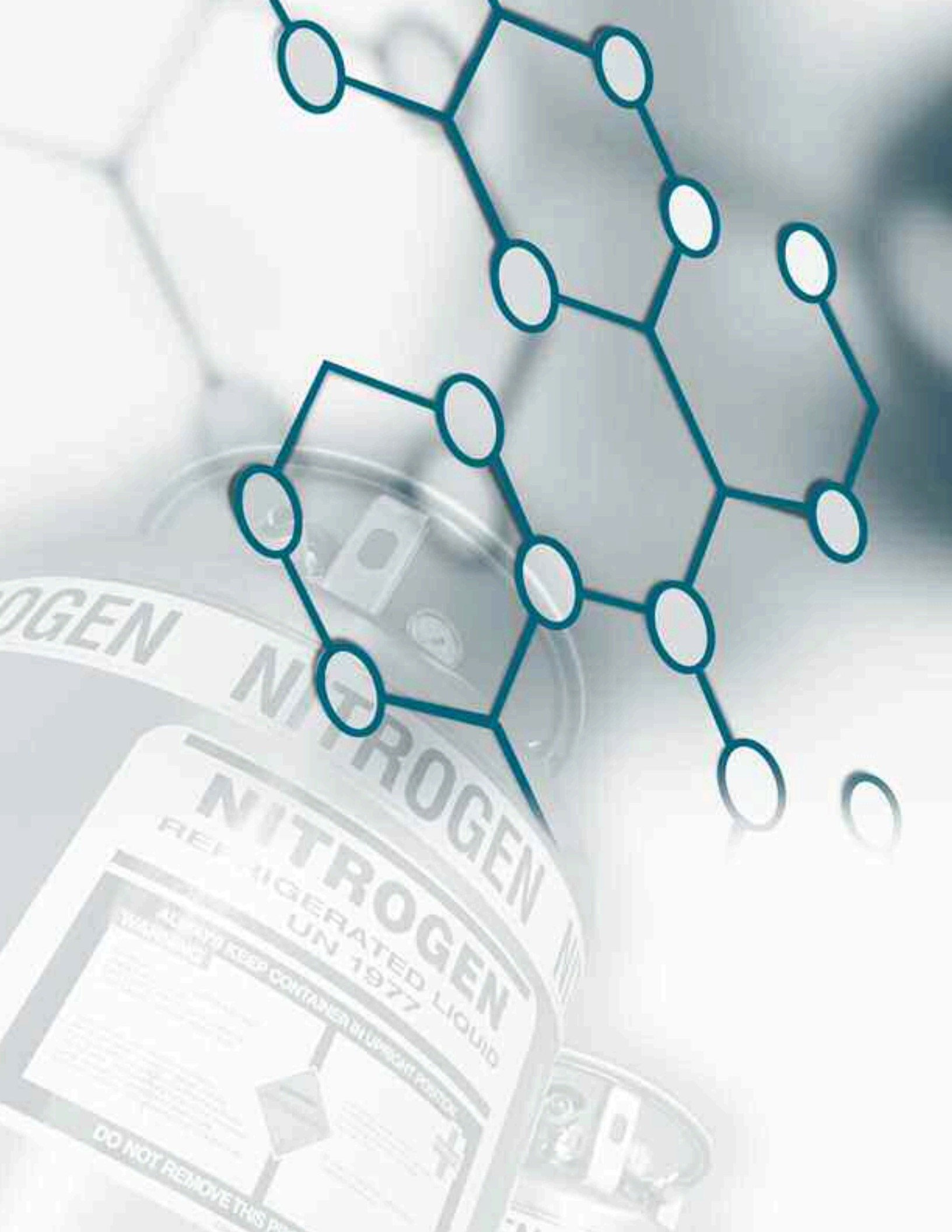
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Refrigerators, Dewars, Freezers and Accessories

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When you need the right cryogenic liquid and equipment...You'll find it with us℠.

From cryogenic refrigerators, freezers, and dewars to transfer hoses, low-level alarms, safety products, liquid nitrogen, and even dry ice — Airgas is the one source more life science laboratories turn to for help in efficiently managing their cryogen operations.

Airgas partners with Taylor-Wharton to jointly market the Taylor-Wharton RDF line to the life sciences industry. With the combination of reliable Airgas cryogens, Taylor-Wharton refrigerators, freezers, dewars, and equipment accessories, Airgas helps reduce the headaches and hassles of long-term sample storage.

Airgas also offers the right cryogenic expertise.

With Airgas, you get the support of some of the most knowledgeable technical and customer support specialists in the industry. We know the needs of life sciences laboratories. Highly trained technicians will review your needs and provide the right products and services according to rigid standards to make sure you get precise, consistent performance.

Call on us for:

- Applications expertise
- On-site gas and equipment inventory management
- Regulatory expertise
- Distribution synergies with other gases, equipment and safety supplies
- Vendor consolidation
- Online ordering and account management

Safe Handling of Cryogenic Liquids

Most cryogenic liquids are odorless, colorless, and tasteless when vaporized. When cryogenic liquids are exposed to the atmosphere, the cold boil-off gases condense the moisture in the air, creating a highly visible fog.

The products found in liquid containers are nitrogen, argon, oxygen, helium, carbon dioxide and nitrous oxide. The containers are double-walled, vacuum vessels with multilayer insulation in the annular space. The two primary advantages of a liquid container are that it contains a large volume of gas at a relatively low pressure and it provides a source of cryogenic liquids which can be easily handled.

Although these containers are well insulated, heat will continuously leak into the product, due to the extremely large temperature difference between the cryogenic liquid and the ambient environment. The heat leak will cause some vaporization to occur. Vaporized product, if not used, will collect in the vapor space above the liquid and build pressure—called the head pressure. Head pressure will build in the container and periodically vent via the pressure relief valve. Vaporization rates will vary and may be as low as 0.4% or as high as 3% of the container's volume per day. This is a normal and safe function of the container.

All cryogenic liquids produce large volumes of gas when they vaporize. The expansion ratio is the amount of gas generated from a given amount of liquid. Table 1 shows the liquid-to-gas expansion ratios for the common cryogenic fluids. If a sufficient amount of liquid is vaporized within a closed container, it will produce enormous pressures that could rupture the vessel. For this reason, cryogenic liquid containers are protected with multiple pressure relief devices. Similarly, any system for the storage and delivery of cryogenic liquids should be carefully designed to avoid trapping cryogenic liquid at any point in the system by installing a relief device.

Vaporization of cryogenic liquids (except oxygen) in an enclosed area can cause asphyxiation. Use of a low-oxygen detector is highly recommended. Vaporization of liquid oxygen can produce an oxygen-rich atmosphere. Although oxygen is not flammable, it is an oxidant and will support and accelerate the combustion of other materials. Vaporization of liquid hydrogen can form an extremely flammable mixture with air.

Always handle these liquids carefully. Because of their extremely low temperatures, they can produce cryogenic burns and frostbite. When spilled on a surface, they tend to cover it completely and, therefore, cool a large area.

The vapors from these liquids are also extremely cold and can produce burns. Even brief exposure, may damage delicate tissues, such as the eyes.

Following are some general guidelines to use when working with cryogenic liquids. For more complete information, refer to the appropriate Material Safety Data Sheet (MSDS) available through www.airgas.com, or call Airgas National Technical Support at 1-877-ASG-4-GAS.

Wear Personal Protective Clothing and Equipment

Face shields are recommended during transfer and handling of cryogenic liquids. If severe spraying or splashing could occur, safety glasses or chemical goggles will provide additional protection. Wear cryo gloves approved for cryogenic use when handling objects that come into contact with cryogenic liquids and vapor. Trousers should be worn on the outside of boots or work shoes. Depending on the application, it may be advisable to wear special clothing.

Boiling and splashing always occur when charging or filling a warm container with cryogenic liquid or when inserting objects into these liquids. Perform these tasks slowly to minimize boiling and splashing. Use tongs to withdraw objects immersed in a cryogenic liquid. Never touch uninsulated pipes or vessels containing cryogenic liquids. Flesh will stick to extremely cold materials. Even nonmetallic materials are dangerous to touch at low temperatures. In addition to the hazards of frostbite or flesh sticking to cold materials, objects that are soft and pliable at room temperature, such as rubber or plastic, become hard and brittle and are broken easily at these extremely low temperatures.

Table 1

Expansion Ratios at 70ºF of Common Cryogenic Fluids (Liquid to Gas*)

Cryogenic Liquid	Expansion Ratio
Argon	1 to 841
Helium	1 to 754
Hydrogen	1 to 848
Nitrogen	1 to 696
Oxygen	1 to 861

*For Example, 1 cubic foot of liquid argon will create 841 cubic feet of gaseous argon at 70ºF

Airgas National Technical Support

Call Toll-Free 1-877-ASG-4-GAS (1-877-274-4427) for expert assistance in solving your cryogenic technical questions.

Contents

LAB Series

LAB Series high-performance freezers incorporate durable, lightweight construction for maximum holding times and optimum capacities. The all stainless steel design assures -180°C vapor storage for large vial capacities up to 80K in box-type racks.

- **Near liquid nitrogen temperature at the top of the rack**
- **Aluminum turntable is easy to grip**
- **Turntable pivots for easier movement and access**
- **Designed for efficient, maximized inventory**
- **Holds 100-cell and 25-cell racks**
- **Hinged, lockable lid has a hard polycarbonate boot**
- **Flat tabletop provides a convenient work surface**
- **Integrated step folds out of the way when not in use**

LAB Series

Models		20K	40K	80K
Dimensions				
External Operating Height (Top of Step to Lid Opening)	- in.	42.5	42.5	42.5
	- mm.	1080	1080	1080
Step Height	- in.	11.0	11.0	11.0
	- mm.	279	279	279
Overall Height (Top of Control Interface)	- in.	60.0	60.0	60.0
	- mm.	1524	1524	1524
Usable Height Internal	- in.	30.0	30.0	30.0
	- mm.	762	762	762
Outside Diameter	- in.	34.0	45.0	59.5
	- mm.	863.6	1143	1511
Internal Working Diameter	- in.	29.5	40.5	55.0
	- mm.	750	1029	1397
Neck Opening	- in.	13.0	18.0	24.5
	- mm.	330	457	622
Capacity				
Liquid Nitrogen Capacity	L	407	606	1350
Power Supply *(1)*	VAC	16.5	16.5	16.5
Evaporation Rate *(2)*	L/day	8.0	9.0	15.0
Weight, Empty	- lb.	650	920	1550
	- kg.	295	417	703
Maximum Gross Weight	- lb.	1375	2000	3956
	- kg.	624	907	1794

(1) This is the power supply for the standard battery backup version. The Kryos version (No Battery) uses a 24 VAC power supply.

(2) Evaporation rate is nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.

Inventory Control Systems

LABS Series Model	System Description	System Vial Capacity	Product Number
20K	20K-13-2-81-C	16042	CS2001
	20K-13-2-100-SS	19500	CS2002
40K	40K-13-2-81-C	34190	CS4001
	40K-13-2-100-SS	41600	CS4002
80K	80K-13-2-81-C	64974	CS8001
	80K-13-2-100-SS	79300	CS8002

NOTE: System Vial Capacity based on 1/2" divider opening: 81 and 25 cells for cardboard boxes and dividers; 100 and 25 cells for stainless steel boxes with cardboard dividers; 100, 81 and 25 cells for plastic boxes.

Storage cell boxes are available in cardboard, plastic, and stainless steel. Custom-design systems and blood inventory systems are also available – call for details.

NOTE: All sales are final. Consult your Airgas representative and confirm specifications.

K Series

K Series cryogenic systems provide reliable liquid nitrogen storage with controllable temperatures between –100°C and –196°C. The added safety of automatic filling, alarms, easy access to stored product, and the unique Temperature Gradient Suppression System significantly improves vapor phase storage temperature and recovery.

- **Temperature control standard**
- **Temperature monitor standard**
- **Intuitive electronic touch pad for easy programming**
- **Stainless steel vacuum vessel provides consistent temperature control**
- **Modular design**
- **Durable powder-coated cabinet stands the test of time**
- **Casters help you easily position the freezer**
- **Designed to provide superior vacuum performance**

K Series

Models	3K	10K	24K	38K
Static Holding Time days (1)	19	33	52	74
Working Time Days (2)	12	N/A	N/A	N/A
Evaporation Rate (1) liters/days	2.5	5.0	7.0	8.0
Liquid Nitrogen Capacity liters	48	165 (3)	365 (3)	590 (3)
Weight Empty -lbs.	42.0	245	405	565
Weight Empty - kg.	19.1	111	184	256
Weight Full -lbs.	125	537	1046	1616
Weight Full - kg.	56.7	243	474	733
Neck Diameter in.	14.0	21.0	31.0	39.0
Neck Diameter - mm.	356	533	787	991
Overall Height in.	29.7	44.0	44.0	49.0
Overall Height - mm.	754	1118	1118	1245
Overall Diameter in.	15.4	23.1x30.5 (4)	34.0x38.5 (4)	42.0 (6)
Overall Diameter - mm.	391	587x775	864x965	1067
Usable Height - Internal in.	19.2	29.0	29.0	29.0
Usable Height - Internal - mm.	488	737	737	737
Internal Diameter in.	14.0	21.0 (5)	31.0 (5)	39.0 (5)
Internal Diameter - mm.	356	533	787	991
Roller Base	Call for details.	N/A	N/A	N/A
Cryo-Sentry Level Alarn	Call for details.	N/A	N/A	N/A

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances. (2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions. (3) Liquid Nitrogen Capacity based on liquid full in container up to 2.0 in. (51mm) below booted lid. (4) Maximum required clearance (with lid open) for the 10Ks 69.0 (1753mm); 24Ks 76.0 in (1930mm). Depth with lid open for 10Ks 34.0 (864 mm); 24Ks 48.5 (1232 MM.) (5) Temperature gradient Suppression System reduces internal diameter by approx. 1/4 in. (6.4 mm) (6) Maximum depth 55.0 in. (1397 mm). Maximum height 90.0 in. (2286 mm) with lid open.

hventory Control Systems

K Series Model	System Description	System Vial Capacity	Product Number	Weight (lbs.)
3K	3K-9-2-C	3024	CS0301	33
	3K-9-2-SS	3024	CS0302	49
	3K-6-3-C	2016	CS0303	32
	3K-6-3-SS	2016	CS0304	47
10K	10K-13-2-81-C	8671	CS1001	87
	10K-13-2-100-SS	10400	CS1002	165
	10K-9-3-81-C	6003	CS1004	85
	10K-9-3-100-SS	7200	CS1005	162
24K	24K-13-2-81-C	19581	CS2401	188
	24K-13-2-100-SS	24050	CS2402	220
	24K-9-3-81-C	13743	CS2404	186
	24K-9-3-100-SS	16650	CS2405	216
38K	38K-13-2-81-C	31434	CS3801	241
	38K-9-3-81-C	21762	CS3802	238
	38K-13-2-100-SS	38350	CS3804	353
	38K-9-3-100-SS	26550	CS3805	340

NOTE: System Vial Capacity based on 1/2!divider opening!81 and 25 cells for cardboard boxes and dividers!100 and 25 cells for stainless steel boxes with cardboard dividers.
Special systems for bulk canes storage, as well as for blood and bone marrow canisters and frame storage are also available – call for details.
NOTE: All sales are final. Consult your Airgas representative and confirm specifications.

Aluminum hventory Control Systems

K Series Model	System Description	System Vial Capacity	Product Number	Weight (lbs.)
10K	10K-13-2A-81-C	8671	CS1006	53
	10K-13-2A-100-A	10400	CS1007	67
24K	24K-13-A2-81-C	19581	CS2406	116
	24K-13-2A-100-A	24050	CS2407	149
38K	38K-13-2A-81-C	31434	CS3806	154
	38K-13-2A-100-A	38350	CS3807	185

NOTE: System Vial Capacity based on 1/2!divider opening!81 and 25 cells for cardboard boxes and dividers!100 and 25 cells for aluminum boxes with cardboard dividers!100-cellaluminum boxes come with an attached lid. 3!boxes are cardboard only.
NOTE: All sales are final. Consult your Airgas representative and confirm specifications.

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LS Series

The LS Series (Laboratory Systems) is uniquely designed for large vial capacity in convenient box-type storage racks. These refrigerators provide maximum holding times, which means lower operating costs per vial and fewer refills. The LS6000 with the Auto Tend Controller provides automatic filling and alarm featur

- **Built to last with ribbed, high-strength aluminum body, magniformed neck tube design, and durable paint**
- **Designed for convenient storage with rack index location ring and internal spider**
- **Computer-compatible box storage is perfect for simple inventory management**
- **Superior vacuum performance and super insulation provide maximum holding times**
- **Lid can be locked to protect samples**
- **For added security, a low-level alarm is available with remote monitoring capabilities**
- **Roller bases are available for easy mobility**
- **The LS6000 is available with the Auto Tend Controller for added peace of mind**

LS Series

Models	LS750	LS3000	LS4800	LS6000
Static Holding Time days (1)	130	106	153	194
Working Time Days (2)	80	66	96	120
Evaporation Rate (1) liters/days	0.27	0.76	0.85	0.84
Liquid Nitrogen Capacity liters	35	81	130	165
Weight Empty -lbs.	39	70	90	121
Weight Empty - kg.	17.7	31.8	40.9	55.0
Weight Full (3) -lbs.	101.3	214.2	312.4	410.0
Weight Full (3) - kg.	46.0	97.4	146.1	186.4
Neck Diameter in.	4.7	8.5	8.5	8.5
Neck Diameter - mm.	119	216	216	216
Overall Height in.	26.8	28.8	35.1	39.0
Overall Height - mm.	681	731	892	991
Overall Diameter in.	18.8	26.9	26.9	26.9
Overall Diameter - mm.	478	683	683	683
2ml vial capacity (4)	750 (5)	3000 (5)	4800 (6)	6000 (7)
Box Size - Shape	Square	Square	Square	Square
Size in.	3.0 x 3.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0
Size mm.	76 x 76	127 x 127	127 x 127	127 x 127
Vials per box	25	100	100	100
Roller Base	Available	Available	Available	Available
Cryo-Sentry Level Alarm	Available	Available	Available	Available
AutoTend Controller Kit	N/A	N/A	N/A	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history and manufacturing tolerances.
(2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.
(3) Without canisters or racks.
(4) 2.0 ml vial size: 12.5 mm O.D. internal thread.
(5) 6-5-2
(6) 6-8-2
(7) 6-10-2

NOTE: **Inventory Control Systems are included with LS Series refrigerators.**

XT Series

The XT (Extended Time) Series of cryogenic refrigerators is designed for storing a wide variety of materials at cryogenic temperatures for the long term. The XT Series offers a low-profile XTL model with 5 canisters.

- **Rugged construction – ribbed, high-strength aluminum body, magniformed neck tube design, and durable paint**
- **Designed for versatility with convenient canister index location ring and internal spider**
- **Maximum holding times are assured with superior vacuum performance and super insulation**
- **Lockable lid protects samples**
- **A low-level alarm is available with remote monitoring capabilities for added security**
- **Roller bases are available for easy mobility**

Models		*XTL3*	*XTL8*	*XT10*	*XT20*	*XT34*
Static Holding days(1)		27	80	100	230	340
Working Time days(2)		17	50	62	140	212
Evaporation Rate(1) liters/days		0.11	0.10	0.10	0.09	0.10
Liquid Nitrogen Capacity liters		3	8	10	20.7	34
Weight Empty	lbs.	7.2	19.6	16.5	26	34.75
	-kg.	3.3	8.9	7.5	11.8	15.8
Weight Full(3)	-lbs.	12.5	33.8	34.3	62.8	95.3
	-kg.	5.7	15.4	15.6	28.6	43.3
Neck Diameter	-in.	2.0	2.0	2.0	2.0	2.0
	-mm.	51	51	51	51	51
Overall Height	in.	17.2	19	23.8	25.8	26.3
	-mm.	437	483	597	655	668
Overall Diameter in.	7.6	15.6	11.4	15.6	18.8	
	-mm.	193	396	290	396	478
Number of Canisters		6	6	6	6	6
Canister Dimensions(4)	-in.	1.5x5	1.5x5	1.5x11	1.5x11	1.5x11
	-mm.	38x127	38x127	38x279	38x279	38x279
Number of 1.2 ml & 2.0 ml vials (5/cane)		N/A	N/A	150	150	150
Number of 1.2 ml & 2.0 ml vials (6/cane)		N/A	N/A	180	180	180
Number of 1/2 cc straws (10/cane)		N/A	N/A	540	540	540
Number of 1.2 cc straws - Bulk (1 level)		750	750	750	750	750
Number of 1/2 cc straws - Bulk (2 levels)		N/A	N/A	1500	1500	1500
Roller Base		N/A	Available	N/A	Available	Available
Low-Level Alarm		N/A	N/A	N/A	Available	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.
(2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.
(3) Without canisters
(4) Canisters also available in 5.0 in. (127 mm) height for 10 L, 20 L and 34 L
NOTE: Inventory Control Systems are included with LS Series refrigerators.

C Series

The high-capacity HC Series refrigerators store large quantities of a variety of samples at cryogenic tempera tures. These refrigerators are designed for storing at temperatures ranging between –196°C (320°F) at the liquid surface and –190°C (–310°F) at the canister top.

- **Designed for high capacity storage**
- **Ribbed, high-strength aluminum body, magniformed neck tube design, and durable paint help these refrigerators last**
- **Provides versatile storage with convenient canister index location ring and internal spider**
- **Maximum holding times are assured with superior vacuum performance and super insulation**
- **A low-level alarm is available with remote monitoring capabilities for added security**
- **Roller bases are available for some models**

Models		CL12	C20	C34	C35	VC35
Static Holding days(1)		60	87	200	130	130
WorkingTime days(2)		37	54	125	81	81
Evaporation Rate(1) liters/days		0.20	0.23	0.17	0.27	0.27
Liquid Nitrogen Capacity liters		12	20	34	35	35
Weight Empty	lbs.	21.6	26.4	35.38	39	37.9
	-kg.	9.8	12.0	16.1	17.7	17.2
Weight Full(3)	-lbs.	43.0	62.0	95.9	101.3	100.2
	-kg.	19.5	28.2	43.6	46.0	45.5
Neck Diameter	-in.	3.6	3.6	3.6	4.7	4.7
	-mm.	91	91	91	119	119
Overall Height	-in.	19.0	24.25	26.31	26.8	26.8
	-mm.	482	615	668	681	681
Overall Diameter	-in.	15.6	15.6	18.8	18.8	18.8
	-mm.	396	396	478	478	478
Number of Canisters		6	6	6	10	6 (4)
Canister Dimensions	in.	2.75x5	2.75x11	2.75x11	2.64x11	3.7x11
	-mm.	70x127	70x279	70x279	67x279	94x279
Number of 1.2 ml & 2.0 ml vials (5/cane)		N/A	570	570	850	850
Number of 1.2 ml & 2.0 ml vials (6/cane)		N/A	684	684	1020	1260
Number of 1/2 cc straws (10 per cane)		N/A	1850	1850	2800	3000
Number of 1.2 cc straws - Bulk (1 level)		2940	2940	2940	4900	4950
Number of 1/2 cc straws -		N/A	5880	5880	9800	9900
Bulk (2 levels)						
Roller Base		Available	Available	Available	Available	Available
Cryo-Sentry Level Alarm		N/A	Available	Available	Available	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents,atmospheric conditions, container history,and manufacturing tolerances.
(2) Work time is an arbitrary,reference-only value to estimate container performance under the actual operating conditions.
(3) Without canisters or racks.
(4) Optional 7th canister available to increase storage capacity by 23%

LD Series

The LD Series cryogenic dewars are perfect for storing and dispensing small amounts of liquid nitrogen. The LD Series includes a beaker-style dewar with a wide mouth (LD5) and a pitcher-style model (LD4) for easy pouring.

- **State-of-the-art construction and advanced insulation materials for high thermal efficiency**
- **Ribbed, high-strength aluminum body, magni-formed neck tube design, and durable paint make these dewars rugged**
- **Easy to operate – light-weight, snap-on cap and precise-fitting neck tube assure tight closure and easy access**
- **Large, convenient handles for easy maneuvering**
- **Superior vacuum and insulation performance for maximum holding times**

- **Optional equipment includes a liquid withdrawal device, tipping stand, dippers, and roller bases for some models – call for details**

Models		LD4	LD5	LD10	LD25	Classic 25	LD35	LD50
Static Holding days(1)		10	6	45	109	119	152	122
Working Time days(2)		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Evaporation Rate(1) liters/days		0.40	0.77	0.22	0.23	0.21	0.23	0.41
Liquid Nitrogen Capacity liters		4	5	10	25	25	35	50
Weight Empty	lbs.	6.6	6.9	14.5	23.2	19	35.1	38.7
	-kg.	3.0	3.1	6.6	10.5	8.6	16.0	17.6
Weight Full	lbs.	13.7	15.8	32.3	67.7	63.5	97.4	127.7
	-kg.	6.2	7.2	14.7	30.8	28.9	44.3	58.0
Neck Diameter	in.	1.2	5.6	2.0	2.5	2.0	2.5	2.5
	-mm.	30	142	51	64	51	64	64
Overall Height	-in.	17.0	17.5	23.5	25.8	22.9	26.3	32.4
	-mm.	432	445	597	655	582	668	823
Overall Diameter	in.	7.6	7.6	11.4	15.6	15.5	18.8	18.8
	-mm.	193	193	290	396	394	475	475
Liquid Withdrawal Device P/N		N/A	N/A	N/A	Available	N/A	Available	Available
Roller Base P/N		N/A	N/A	N/A	Available	Available	Available	Available
Tipping Stand P/N		N/A	N/A	N/A	Available	Available	N/A	N/A
DipperP/N		N/A	Available	Available	Available	Available	Available	Available

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents,atmospheric conditions,container history, and manufacturing tolerances.
(2) Work time is an arbitrary,reference-only value to estimate container performance under the actual operating conditions.

CX and CX!Series Shippers

The CX Series is designed especially for the safe transport of your valuable samples at cryogenic temperatures. The unique absorbent material prevents a liquid spill if the unit is tipped over. Sample storage temperature inside the shipping cavity remai at approximately –190°C until the liquid nitrogen evaporates from the absorbent material.

- **Designed with Advanced Concept Absorbent for faster charging**
- **Complies with IATA regulations**
- **Durable construction with strong neck design, ribbed high-strength aluminum body and top-quality, long-lasting paint finish**
- **Maximum holding times are assured with superior vacuum performance and super insulation**
- **A temperature logger is available for shipments**
- **Lids lock to protect contents**
- **Models for shipping infectious materials comply with IATA 602 and 650 regulations – call for details**

Models		CX100	CX500	CX1100	CX5500
Static Holding days(1)		30	14	15	14
Working Time days(2)		21	7	11	7
Evaporation Rate(1) liters/days		0.18	0.60	0.25	0.60
Liquid Nitrogen Absorbed liters		4.4	6.4	3.6	7.7
Weight Empty	lbs.	11.7	30	11.7	30
	-kg.	5.3	13.6	5.3	13.6
Weight Full(3)	-lbs.	19.5	41.4	19.5	41.4
	-kg.	8.9	18.8	8.9	18.8
Neck Diameter	in.	2.78	8.5	3.58	8.5
	-mm.	71	216	91	216
Overall Height	in.	18.4	26.9	19.4	26.9
	-mm.	467	683	493	683
Overall Diameter	in.	9.2	15.5	9.2	15.5
	-mm.	234	391	234	391
Number of Canisters	1.	N/A	N/A	N/A	
Canister Dimensions	in.	2.64x11	N/A	N/A	N/A
	-mm.	67.279			
Number of 1.2 ml & 2.0 ml vials (5/cane) (4)		85	500	TBD	600
Number of 1.2 ml & 2.0 ml vials (6/cane) (4)		102	500	TBD	600
Number of 1/4 cc straws - Bulk (2 levels)		1820	N/A	TBD	N/A
Number of 1/2 straws - (10/cane)		280	N/A	TBD	N/A
Number of 1.2 cc straws - Bulk (1 level)		490	N/A	N/A	N/A
Shipping Case P/N		CX10-8C00	CP19-8C00	C10-8C00	CP19-8C00
Padded Carton		3701-9277	N/A	3701-9277	N/A
5 shelf rack		N/A	RS30-9C44	N/A	RS30-9C44
Poly Carb 100 box		N/A	R24K-9C44	N/A	R24K-9C44

(1) Evaporation rate and static holding time are nominal. Actual rate may be affected by the nature of the contents, atmospheric conditions, container history, and manufacturing tolerances.
(2) Work time is an arbitrary, reference-only value to estimate container performance under the actual operating conditions.
(3) Without canisters or racks.
(4) CX500 vials are stored in 100 cell boxes.

acks for D!

Description: These mounting racks are designed to safely secure up to four gas cylinders, two in front, two in back, as well as one of our Changeover Panels. Racks feature unobstructed front and rear entry. Shipped in three boxes!some assembly is required. Assembly time is 15–30 minutes with standard tools.

CHANGEOVER PANELS

Accessories

Ordering hformation

Product Number	Description	Dimensions	bwer Supply
Y99-4CYLRACK	4- Cylinder Floor Rack	27.75!W x 72!H x 20!D	White Powder Coat Epoxy
Y99-2DEWARRACK!	2- Cylinder Floor Rack	14!W x 65.5!H x 18!D	Aluminum

Designed for Liquid Cylinder Gas Phase Changeover Panels

ulsar ™ and ulsar ™ ! Single-as Detectors

Uniquely design Pulsar™ Single-Gas Detectors from MSA provide maintenance-free, 24-month gas monitoring with a battery that offers 33!more capacity than the competition. They require no field calibration nor battery or sensor replacement. Large character numeric displays accurately count down service life. Units are IP54 rated virtually impervious to water and dust ingress, and are designed to survive a 6-foot drop. They attach during even the roughest use with standard spring and suspension attachment clips. Choose a Pulsar™ Detector with audio and visual alarms for CO, H_2S or O_2, or a triple alarm unit with added vibrating alarm for O_2

With the same rugged durability, easy-to-use Pulsar™ Single-Gas Detectors from MSA feature a gas concentration display and replaceable sensor and battery Replacing the patented, leakproof stainless steel Button Sensors is easy, and the replaceable long-life lithium battery extends the working life of the unit. Choose best-in-class alarm systems with piercing audio, ultra-bright quadruple visual and optional vibrating alarms. Lifetime warranty.

ulsar ™

roduct Number	*Description*
MSA 10032580	A-PULSAR-1-A CO Alarm
MSA 10032592	A-PULSAR-3-N H_2S Alarm
MSA 10032594	A-PULSAR-5-X O_2 Alarm
MSA 10032595	A-PULSAR-6-X O_2 Alarm with vibrating Alarm

ulsar ™!

roduct Number	*Description*
MSA 10036171	Pulsar™+ CO Alarm
MSA 10036174	Pulsar™+ CO with Vibrating Alarm
MSA 10036172	Pulsar™+ H_2S Alarm
MSA 10036175	Pulsar™+ H_2S with Vibrating Alarm
MSA 10036172	Pulsar™+ O_2 Alarm
MSA 10036175	Pulsar™+ O_2 with VibratingAlarm

Liquid Cylinder Gas Phase Models

Description: **This Airgas® high-purity automatic changeover panel provides continuous, uninterrupted gas supply on installations where a reserve liquid cylinder is used. The unit consists of two identical regulators, one delivering gas at a slightly higher pressure than its twin. When the service cylinder is empty, the unit will automatically withdraw gas from the reserve cylinder, thus eliminating the need to shut down the system to replace empty cylinders. The pressure gauges immediately indicate which cylinder is in use.**

Gas saver feature: **On models as indicated in ordering information insert, an integral gas saver circuit has been incorporated into the manifold to prevent the reserve cylinders accumulated head gas pressure from being wastefully discharged to atmosphere. During operation, the gas saver directs reserve cylinder pressure buildup to the primary bank where it is used. During shutdown periods, both banks may vent to atmosphere. Adequate ventilation must be provided to remove or disperse these gas discharges safely.**

Notes:
Alarm systems to indicate that cylinder changeover has occurred can be factory installed at an additional cost.

Design Features

Gas Saver Circuit on Certain Models
pays back cost of unit through gas savings.
Automatic Changeover
provides uninterrupted high-purity gas supply.
Control Knob
permits safe removal of the empty cylinder while another cylinder is use.
Convoluted Stainless Steel Diaphragms
provide superior leak integrity without contamination from non-metallic liner or seal.
Diaphragm Packless Isolation Valves
allow for positive shut-off during cylinder change out.
Diaphragm Packless Purge Valves
allow for purging pigtails eliminating atmospheric contaminants.
Built-In Line Regulator
provides ranged delivery pressure of 10–150 psig.
Extended Length Pigtails
6 foot stainless steel corrugated bellows w/check valves.

Specifications	
Maximum Rated Inlet Pressure	400 psig
Outlet Pressure Ranges	10–150 psig (adjustable)*
Maximum Flow Rate	200 scfh @ 150 psig
Ambient Operating Temperature	-40° F to +150° F
Designed Leak Range	Bubble-Tight (helium)
Weight	11 lbs
Outlet	1/4" Compression Fitting
Pigtails	72" Corrugated Bellows, 316 Stainless Steel Flex

Materials	
Body	Nickel-Plated Brass or 316 Stainless Steel
Bonnet	Nickel-Plated Brass
Seat	PCTFE
Diaphragm	316L Stainless Steel
Inlet Gauge	1 1/2" Nickel-Plated Brass or Stainless Steel
Outlet Gauge	2" Nickel-Plated Brass or Stainless Steel
Filter (40-micron)	Stainless Steel Screen

To achieve a delivery pressure of 150 psig, the liquid cylinder pressure build circuit must be set to at least 200 psig or be connected to a 300 psig liquid cylinder. A cylinder with the pressure build circuit set between 100–175 psig will deliver only 75–125 psig.

Ordering Information

Product Number	Material	No. Cyl.	Max Outlet Pressure (psig)	Capacity (scfh @ Max Del. Pressure)	Inlet Gauge Range (psig)	Delivery Gauge Range (psig)
*Y11-CP120LP(CGA)	Brass	2	150	200	0–400	0–200
**Y11-CP120RLP(CGA)	Brass	2	150	200	0–400	0–200
*Y11-CP140LP(CGA)	Brass	4	150	200	0–400	0–200
*Y11-CP160LP(CGA)	Brass	6	150	200	0–400	0–200
*Y11-CP420LP(CGA)	316 SS	2	150	200	0–400	0–200
*Y11-CP440LP(CGA)	316 SS	4	150	200	0–400	0–200

*Gas saver circuit
** No gas saver circuit

Available Options

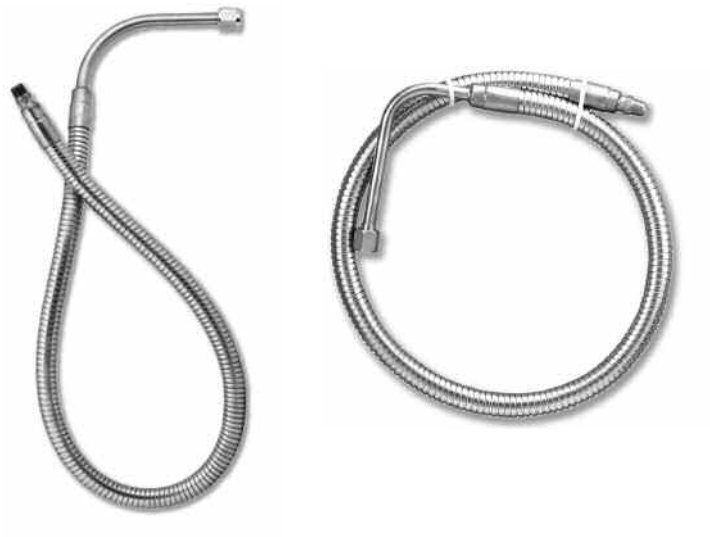
Product Number	Description
Y78-200ALPK	Non-Flammable Alarm Package

Transfer ɒses and hase Separator

Description: These cryogenic transfer hoses are available in 4-foot and 6-foot lengths. They feature a stainless steel anti-kink armor casing. The CGA end features a 90-degree bend for ease in connecting to liquid cylinders. Hoses are CGA 3/8! MNPT for helium, nitrogen, and argon, and CGA 440 x 440 for oxygen. Matching phase separators may be purchased at an additional cost.

CRYOGENIC ACCESSORIES

Transfer Hoses



Design Features

Ultimate Flexibility
makes connection easy; coil up for storage.

Full Armor Casing
protects hose from abrasion — very flexible, no broken wires.

Machined End Connections
machined from bar stock, not from tubing — eliminate distortion, cracking, leaks.

Stainless Steel Fitting
will not wear like brass.

Quality Design
protects flare end from damage.

Stainless Steel Construction
provides long life, faster cool-down, durability.

Low Profile Corrugations
ensure faster filling, lower pressure drop, and less product loss.

Hoses for Oxygen
are provided cleaned, capped and bagged for oxygen service.

Ordering hformation

Product Number	*Description*	*Length (ft)*	*ɒs Service*
Y15-4CH429538	CGA 295 x 3/8! MNPT	4	Nitrogen, Argon, Helium
Y15-4CH629538	CGA 295 x 3/8! MNPT	6	Nitrogen, Argon, Helium
Y15-4CH4440	CGA 440 x CGA 440	4	Oxygen
Y15-4CH6440	CGA 440 x CGA 440	6	Oxygen

CDENC ACCESSOES | *hase Separator*

Available Options

Product Number	Description	Service
Y15-PSB38	Phase Separator Bronze, 3/8! FNPT x 3!length	Nitrogen,Argon, Helium

Liquid Cylinder Liquid hase Models

Description: This microcontroller-driven system monitors manifold pressure and the presence or absence of liquid nitrogen in the manifold. Each supply tank connects to the manifold through a 24-volt AC solenoid valve. Each supply tank's solenoid valve is energized only when liquid needs to be delivered to the freezers. Through a series of timed solenoid on periods, manifold pressure and liquid nitrogen presence in the manifold confirm either the viability of the supply or that a switchover to the other supply tank is needed. A switchover to the altnernate supply tank is made when the manifold pressure remains low and no liquid is ever detected.

CHANGEOVER PANELS

Nitrogen Service

Design Features

Automatic Changeover
between individual or liquid cylinder banks.

Micro-controller Design
for system flexibility.

Multiple Solenoid Valves
2 to 8 solenoid valves.

Monitors
pressure and the flow of liquid nitrogen.

Voltage Requirements
low voltage – 24VAC.

Alarms
visual alarm indicates when a supply cylinder is empty; audible alarm when all cylinders are empty; relay for remote alarm connection when all cylinders are empty.

Specifications	
Maximum Rated Inlet Pressure	40 psig
Outlet Pressure Ranges	0-22 psig
Maximum Flow Rate	1 liter/minute
Ambient Operating Temperature	32! F to 125!F
Weight	30 lbs.
Inlet/Outlet	1/4! Flare, CGA295
Liquid Detection	Thermistor
Relief Valve	22 psi

Materials	
Valves	Brass
Piping	Brass/Stainless Steel
Mounting Brackets	Painted or Galvanized Steel
Wall Mount Panels	High Density Polyethylene, 1/2! thick

Electrical	
Transformer	120VAC/24VAC, 40VA

Ordering hformation	
hoduct Number	*Description/Material*
Y40-TSSA2	UniversalTank Switcher, 2 solenoid valves
Y40-TSSA(!)	UniversalTank Switcher, ! solenoid valves

(where specifies 2 to 8 ales)

Cylinder Carts and Trucks

Description: Our cylinder carts and trucks are designed for transporting compressed gas cylinders as well as dewers and liquid containers.

Model 99-231100 **is designed for safely transporting single cylinders.**

Model 99-231200 **is designed for transporting single cylinders and features retractable rear wheels for added safety and maneuverability.**

Model 99-231300 **is designed to transport two cylinders and features heavy-duty construction, rigid rear carriage supports and high load capacity.**

Model 99-231400 **is designed for transporting single cylinders up to 20" in diameter. A heavy-gauge toeplate ensures positive placement of the cylinder, reducing the occurrence of dropped cylinders.**

Model 99-231500 **is a patented liquid gas transport system developed for safer handling of cryogenic cylinders up to 1,000 lbs gross weight. Simply align the hook assembly directly in front of the cylinder eyelet hole and turn the handle until the desired height is reached. The patented mechanical lift mechanism allows virtually anyone to safely and easily lift and move a dewar container**

Model 93-NMRCART **is designed for use in MRI applications. Constructed of durable, non-magnetic materials.**

MISCELLANEOUS EQUIPMENT

Accessories

Y99-231100

Y99-231200

Y99-231500

Y99-231400

Ordering Information

Product Number	*Cylinder Sizes Supported*
Y99-231100	300, 200
Y99-231200	300, 200
Y99-231300	300, 200, 3HP, 2HP
Y99-231400	Cryogenic Containers
Y99-231500	Cryogenic Containers
Y93-NMRCART	300, 200

Cylinder loor Savers

Description: These floor savers were designed to protect and preserve tile, wood, carpeted and painte floors from bacteria, rust, corrosion and condensation caused by industrial and medical gas cylinders and liquid dewars. They are ideal for biotech, pharmaceutical, medical and electronic work areas.

The floor savers are constructed of a custom-blended, chemical-resistant, high-impact thermoplastic crafted to eliminate the need to routinely clean and buff floors around cylinders and dewars.

Floor savers, with their moisture collection reservoir, provide a protective barrier between the cylinders and the floor. They prevent transfer of cylinder or dewar contamination and moisture to the work area, providing a safer work environment.

Cleaning solvents, moisture and water will not adversely affect the integrity of the floor saver

Ordering hformation

toduct Number	*Specification*	*Cylinder Sizes Supported*
Y99-LT10	**! Overall Size – 11¼! x 11¼! ! Reservoir – 10!diameter x⅜! ! Capacity – 1 pint ! Weight – approximately 1 lb ! Color – tan**	10" Diameter or Smaller
Y99-LT22	**! Overall Size – 23½! x 23½! ! Reservoir – 22!diameter x⅝! ! Capacity – 4 quarts ! Weight – approximately 6 lbs ! Color – tan**	Dewars 22" or Smaller
Y99-LT33	**! Overall Size – 32!x 33! ! Reservoir – 30!x 30!x ¾! ! Capacity – 5 quarts ! Weight – approximately 9 lbs ! Color – tan**	230L Dewars w/Caster Base

Cylinder Scales !Dial Models

Description: The pressure and temperature of a liquefied gas remains constant as material is withdrawn, as long as a liquid phase remains in the cylinder. Once the liquid phase is exhausted, the pressure drops rapidly and the cylinder empties. This characteristic renders a cylinder pressure gauge virtually useless as a means of estimating the time to total supply depletion. One way to monitor the contents of a cylinder containing a liquefied gas is by weight.

The Model 280 cylinder scale is designed to give a positive indication of the amount of product remaining in the cylinder. Simply subtract the tare weight of the cylinder so that the net contents can be read directly. The optional non-skid ramp makes loading and unloading cylinders convenient, quick, and easy.

These scales are recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane, and heavier hydrocarbon gases.

MISCELLANEOUS EQUIPMENT

Cylinder Scales

Specifications	
Tare Weight Range	0-140 lbs
Net Weight Range	0-140 lbs
Total Weight Capacity	280 lbs (5-lb increments)
Readability	1 lb By Estimation
Dimensions (WxHxD)	10¾! x 10¼! x 2!

Ordering hformation	
hoduct Number	*Description*
Y40-280	Scale with Dial Readout
Y40-280R	Optional Ramp forY40-280

Cylinder Scales !Digital Models

Description: The pressure and temperature of a liquefied gas remains constant as material is withdrawn, as long as a liquid phase remains in the cylinder. Once the liquid phase is exhausted, the pressure drops rapidly and the cylinder empties. This characteristic renders a cylinder pressure gauge virtually useless as a means of estimating the time to total supply depletion. One way to monitor the contents of a cylinder containing a liquefied gas is by weight.

The Model 280 cylinder scale is designed to give a positive indication of the amount of product remainin in the cylinder. Simply subtract the tare weight of the cylinder so that the net contents can be read directly. The optional non-skid ramp makes loading and unloading cylinders convenient, quick, and easy.

MISCELLANEOUS EQUIPMENT

Cylinder Scales

These scales are recommended for use with all liquefied gases such as carbon dioxide, ammonia, nitrous oxide, fluorocarbons, hydrogen sulfide, sulfur dioxide, propane, and heavier hydrocarbon gases.

Specifications	
Tare Weight Range	0-150 lbs
Net Weight Range	0-150 lbs
Total Weight Capacity	0-300 lbs
Alarm Set Point	0-150 lbs
Accuracy	0.5!of Full Scale
Control Box Dimensions (WxHxD)	Control Box - 8!x 2.6!x3¾!
Platform Dimensions (WxHxD)	Model 300 - 15¾! x 17 ½! x 1 ¼! Model 301 - 20!x 20 ½! x 1 ¼!

Ordering Information	
hoduct Number	*Description*
Y40-300	Scale with readout w/ 15¾" x 17½" platform
Y40-301	Scale with readout w/ 20" x 20½" platform

Cryogenic loves !Aprons

A. NSA Cryogen Safety loves

Designed to withstand the ultra-low temperatures encountered when working with cryogens or in other extremely cold environments, NSAs gloves for cryogen safety are water resistant and can also be used to handle dry ice.

NOTE: Not for immerision in cryogenic liquids. Sold per pair.

art Number	Description	Size
N33 G99CRBEWRMDR	Cryogen Wrist Length 12!	Medium
N33 G99CRBEWRLGR	Cryogen Wrist Length 12!	Large
N33 G99CRBEWRXLR	Cryogen Wrist Length 12!	XLarge
N33 G99CRBEMAMDR	Cryogen Mid-Arm Length 14!15!	Medium
N33 G99CRBEMALGR	Cryogen Mid-Arm Length 14!15!	Large
N33 G99CRBEMAXLR	Cryogen Mid-Arm Length 14!15!	XLarge
N33 G99CRBEELMDR	Cryogen Elbow Length 18!19!	Medium
N33 G99CRBEELLGR	Cryogen Elbow Length 18!19!	Large
N33 G99CRBEELXLR	Cryogen Elbow Length 18!19!	XLarge

B. NSA Cryogen Safety Aprons

An inner layer of insulation and an outer water-resistant, yet breathable, laminate work to protect torso and legs from splash and incidental contact with cryogenic liquids. Adustable at the neck and waist, all of these aprons are 24!wide at their widest point.

NOTE: Not for immersion in cryogenic liquids. National Safety Apparel is certified to ISO 9001:2000, with design.

art Number	Description	Size
N33 A02CR24I36IC	Cryogen Apron	36!Length
N33 A02CR24I42IC	Cryogen Apron	42!Length
N33 A02CR24I48IC	Cryogen Apron	48!Length
N33 A02CR24I54IC	Cryogen Apron	54!Length

A. Radnor® Ventilated Safety Goggles

Soft vinyl frame fits snug and can be worn for extended periods of time. Transparent frame allows vision in all directions and has hooded vents that prevent fogging and aids ventilation. Tough polycarbonate lens offers protection against dust and flying particles.

Part Number	Bulk Part Number	Description
64005092	64005093	Clear Polycarbonate Safety Goggles

B. Radnor® Chemical Splash Safety Goggles

Soft vinyl frame that fits snug and can be worn for extended periods of time with comfort. Clear polycarbonate lens and clear frame with indirect ventilation (4 screened vents) allow these goggles to be effective protection against dust, splashes and light impacts.

Part Number	Bulk Part Number	Description
64005094	64005095	Clear Polycarbonate Chemical Splash Safety Goggles

C. Radnor® Replacement Elastic Goggle Band

Exact replacement for goggles listed above.

Part Number	Description
64005098	Elastic Goggle Band (4/pk)

D. Radnor® Polycarbonate Visors

For heavy-duty impact protection, clear Polycarbonate Visors are available in several sizes. Always wear visors with primary eye protection. Meets ANSI Z87+ (high impact) Standard. Made in USA.

Part Number	Description
64051052	Visor 8"x 15.5"x .040"Clear
64051053	Visor 9"x 15.5"x .040"Clear
64051054	Visor 10"x 20"x .040"Clear

E. Radnor® Headgear Faceshield Frame

When no hard hat is required, the Radnor® Headgear Faceshield Frame is a cool, comfortable way to wear a faceshield. It features a ratchet suspension, standard spark guard and adjustability from head sizes 6 1/2 to 8. Visor not included. Meets ANSI Z87.1-2003 Standard. Made in USA.

Part Number	Description
64051061	Headgear Faceshield Frame

SightSense™ by Radnor® 1700 Series Dual Lens Eyewear

From the soft nose pads through the straight spatula temple with length and ratcheting height adjustment, the 1700 Series Dual Lens eyewear is built with comfort in mind. The nylon frame has soft inserts above the ears for a secure fit. The dual lenses wrap around and provide integral side protection and block 100% of harmful UV rays. All of this in a package that weighs less than an ounce. Meets ANSI Z87+ Standard.

Part Number	Description	Frame
64051701	Clear	Burnt Orange
64051702	Clear Anti-Fog	Burnt Orange
64051703	I/O Clear	Burnt Orange
64051704	Gray	Burnt Orange
64051705	Mirror	Burnt Orange

SightSense™ by Radnor® 1300 Series Sport Lens Eyewear

With wrapped temple styling, ergo-grip sleeve and a non-slip nosepiece, the 1300 Series Sport Lens eyewear is attractive and comfortable at the right price. The single lens is retained in the frame by a specially designed channel and blocks 100% of harmful UV rays. Lens features scratch resistant coating for a longer wear life. Meets ANSI Z87+ Standard.

Part Number	Description	Frame
64051301	Clear	Black
64051302	Gray	Black
64051303	Mirror	Black
64051315	Amber	Black
64051304	Clear	Blue
64051305	Gray	Blue
64051313	Clear	Crimson
64051311	I/O Clear	Crimson
64051312	Mirror	Crimson
64051314	Anti-Fog	Crimson

Nitrogen (N_2)

A colorless, odorless, nonflammable cryogenic liquid.

Airgas offers liquid Nitrogen for all your cryogenic needs. We provide various sizes and volumes, including vented 160-, 180- and 240-liter dewars, as well as MicroBulk and bulk deliveries.

Technical Data !Shipping hformation	
Molecular Weight	28.01
Specific Volume	13.8 cf/lb ₮0!F
Flammability Limits in Air	Nonflammable
U.S. DOT Name	Nitrgen, Compressed
ID Number	UN 1066
U.S. DOT Hazard Class	2.2
U.S. DOT Label	Nonflammable Gas
CAS Registry	7727-37-9

Airgas provides liquid Nitrogen in liquid cylinders (dewars), MicroBulk, and bulk deliveries. The table below may help you decide which mode of supply is right for your organization based on your monthly usage. If you use more than 5,000 SCF (61 gallons) of liquid Nitrogen per month, you may be a good candidate for our MicroBulk supply mode. If you use in access of 45,000 SCF (500 gallons) per month, our bulk delivery program may be the most cost-effective solution for you.

For more details, contact the Airgas location nearest you by first calling 1-866-924-7427.

	Mode of Supply	SCF!	Gallons	Liters
	Liquid Cylinders	4,500 - 5,600	48 - 61	180-230
	MicroBulk	5,000 - 48,000	61-539	230-2,000
	Bulk	₰5,000	5₀0	₁,892

Dry ice from the largest supplier in the !S.

If youłe looking for dry ice, youll find it with Airgas. As the largest supplier of dry ice in the U.S., we have 16 plants nationwide and can serve your one facility locally or multiple facilities across the country.

Dry ice from Airgas provides ideal low-temperature cooling for shipping specimens and samples. It is also efficiently used in the preservation of tissue samples, to reduce temperatures for microtomy and histology work, and for shell freezing biological samples.

Pellets – 1/8" to 3/4" bulk, bagged, boxed

Blocks – full, half, 10-lb., 5-lb., airline cut

2

CO_2 gas is inert, colorless, odorless and tasteless. It is also easily and safely liquefied, solidified, handled, and stored. In its solid form, CO_2 has a refrigeration value of approximately 245 BTUs per pound. It readily interacts with water to form carbonic acid, otherwise referred to as carbonated water. CO_2 is commercially available as a food-grade product and is transported and stored in both its liquid and solid phases. It is easily converted from a liquid to dry ice snow or pellets at customer locations. Liquid CO_2 is economically stored in insulated and mechanically refrigerated tanks.

łoduct	*Ordering łformation*					*Equipment ŧecommendations*	
	Cylinder Size	*Contents lbs*	*Standard Valve Outlet (CA)*	*łoduct Number*	*Cylinder ŧessure at 70!! (psig)*	*Description łoduct Number*	*Delivery ŧessure ange (psig)*
Carbon Dioxide (CO_2)	**200**	**60**	**320**	**CD I200S**	**835**	**Two-Stage**	**A!0-25**
	80	**24**	**320**	**CD I80S**	**835**	**Regulators**	**B!0-50**
						Y12-N145 !320	**D!0-100**
łstrument/Coleman coolant						**Y12-244 !320**	**E!0-150**
						Single-Stage	**F!0-250**
						Regulators	**G!0-500!**
						Y11-N145 !320	
						Y11-244 !320	

An idividual or batch analysis is available upon request at a normal charge.
Certificate of Conformance provided upon request.
For cooling applications order this product with a dip tube for liquid withdrawal.
Add Ł!to end of Product Number.

* Insert Delivery Pressure Range Code
** Single Stage Only